MECH3260 Thermal Engineering and Environment

THE UNIVERSITY OF SYDNEY · ENGINEERING · S2 2026 · CLOSED-BOOK MEMORY SHEET · FORMULA SHEET PROVIDED

Full guide + ask Sia about MECH3260

SIDE 1/2 DECISIONS THE PROVIDED SHEET CANNOT MAKE · assumptions → method → output meaning

REVISION ONLY · NOTHING STUDENT-AUTHORED ENTERS

Final 60% · Thermodynamics + Heat Transfer

01 · Exam map

COURSE.JSON · BRIEF

Problems 20% | Mid-sem 20% | Final exam 60%

Test Yourself Quizzes 0% · formative only

"This is a closed book exam." (MECH3260 2026 S2 Canvas Assessment Overview + Tables/Charts page (MD_Assessment_Overview_MECH3260_MECH8260_MECH9260_Thermal_E.md))

FINAL SHAPE	WHAT EARNS MARKS
2 hours; formal exam period; both halves; not a hurdle	Recognise family; declare assumptions; substitute consistently; interpret result

WHAT THE EXAM SHEET GIVES YOU

Thermodynamics equation/data sheets; Heat Transfer equation/data sheet; required property tables and charts. Know the names and selection cues; do not try to replace the supplied material.

02 · Pick the boundary

CH 1 TOPIC MAP

STEM CUE	START HERE
Fixed mass; sealed piston–cylinder	**Closed:** $Q_{in} - W_{out} = \Delta U$; moving-boundary work is path area
Mass enters/leaves; turbine, compressor, nozzle, exchanger	**Control volume:** steady-flow rate balance; use h = u + Pv
Low P / high T gas, far from condensation	PV = mRT = $nR_u T$; du = $C_v dT$; dh = $C_p dT$
Steam near saturation	Use property tables, not ideal-gas relations

FAST CHECKS

$R = R_u/M$; $R_u = 8.314$ kJ/(kmol·K)

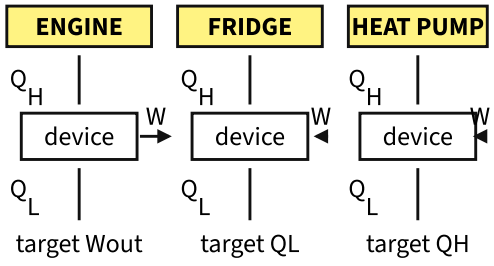
State needs two independent properties before a table lookup.

STRIP THE GENERAL BALANCE CAREFULLY

TERM	DELETE ONLY WHEN THE STEM EARNS IT
ΔKE, ΔPE	Negligible speed/elevation change, not merely because no values were supplied
$\dot{Q}$	Adiabatic/insulated device
$\dot{W}_s$	No shaft/electrical/boundary-work mechanism
Storage	Steady state, after start-up transients

Label every arrow into or out of the boundary first. Then apply one sign convention throughout; a negative calculated transfer means the actual direction is opposite to the assumed arrow.

OUTPUT SENTENCE



Two reservoirs, three desired outputs: name the device before selecting efficiency or COP.

03 · 2nd-law decisions

CH 1

CEILINGS · ABSOLUTE T ONLY

$\eta_{th} = 1 - Q_L/Q_H < 1$

$\eta_{th,rev} = 1 - T_L/T_H$

$COP_{R,rev} = T_L/(T_H-T_L)$

$COP_{HP,rev} = T_H/(T_H-T_L)$

IF THE QUESTION ASKS…	DECISION
Could this efficiency/COP exist?	Compare with Carnot at the same reservoirs
Entropy change, constant C_p/C_v	Use integrated ideal-gas relation
C_p varies / table columns supplied	Use table route, not constant-C shortcut
Isolated system feasibility	$\Delta S_{isolated} \geq 0$; equality only reversible

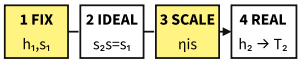
PROPERTY ROUTE

TdS = dU + P dV = dH - V dP

Entropy can fall for the chosen system; it cannot fall for system + surroundings.

04 · Real turbine / compressor

CH 1 FAQ



ideal exit ≠ real exit

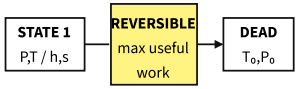
Component-efficiency questions are always the same four-state lookup sequence.

DEVICE	H_{1S} DEFINITION	REALITY CHECK
Turbine	actual work / ideal work	real exit hotter; less work out
Compressor	ideal work / actual work	real work in larger

ENTROPY ROUTE CHOOSER

DATA	ROUTE / CHECK
Constant C_p, P, T	Integrated ideal-gas entropy relation; dimensionless ratios
Tables or varying C_p	Tabulated entropy / relative-pressure columns
Adiabatic + reversible	$s_2 s = s_1$, fixes ideal exit at given pressure

TRAP *Same inlet and exit pressure, but the ideal exit is only an intermediate state. Recover the actual exit property after applying η_{is}.*



Sgen > 0 ⇒ exergy destroyed

Exergy is work potential relative to T_0, P_0; energy survives irreversibility, work potential does not.

06 · Exergy balance choices

CH 2 FAQ

PROMPT	FAST ROUTE
Destroyed exergy	Write entropy balance, find S_{gen}, multiply by T_o
Total destruction	Extend boundary to T_o: heat-exergy transfer factor becomes zero
Useful boundary work	$W_u = W - P_o(V_2 - V_1)$; term vanishes for rigid boundary / cycle
Device quality	$\eta_{II} = W_u/W_{rev}$ for work out; reciprocal for work in

Irreversibility = reversible work − useful actual work. Do not confuse thermal efficiency (energy fraction) with second-law efficiency (closeness to the reversible maximum).

COMMENT MARK *Name the dominant mechanism: friction/turbulence, mixing, free expansion, or heat transfer across a finite temperature difference.*

07 · Mixture chain

CH 3 TOPIC MAP

DO IN THIS ORDER

$n_i = m_i/M_i \rightarrow y_i = n_i/n$

$M = \Sigma y_i M_i \rightarrow R = R_u/M$

$P = nR_uT/V \rightarrow P_i = y_i P$

MODEL	PICTURE / RULE	USE
Dalton	Each component fills V; $P = \Sigma P_i$; $P_i = y_i P$	Entropy and condensation; also P-v-T
Amagat	Each component at P; $V = \Sigma V_i$; $V_i = y_i V$	P-v-T only; not entropy/condensation
Non-ideal	$Z = \Sigma y_i Z_i$, or Kay pseudocritical route	High-pressure stem; name the route used

Gibbs–Dalton: extensive U, H and S sum by component at mixture T; the entropy sum uses each partial pressure, not total pressure.

TWO FREE CHECKS

$\Sigma y_i = 1$ and $\Sigma P_i = P$ (or $\Sigma V_i = V$).

WHAT A COMPLETE MIXTURE ANSWER SHOWS

1. Convert every component mass to kmol using its own molar mass.

08 · Combustion order

CH 5



Balance first; ratios follow.

Stoichiometry first; composition, ratios and dew point are downstream bookkeeping.

09 · Combustion judgement

CH 5 FAQ

QUANTITY	MEANING / DIRECTION
% theoretical air	100% is stoichiometric
% excess air	Air above theoretical; more air ⇒ leaner, lower flame temperature
$\phi = (F/A)_{actual}/(F/A)_{stoich}$	ϕ>1 rich; ϕ<1 lean. It moves opposite to excess air
Product dew point	$y_{H_2O} \rightarrow P_v = yP \rightarrow T_{sat}(P_v)$; below this, water condenses
LHV / HHV	LHV if product water remains vapour; HHV if latent heat is recovered by condensation

REACTING 1ST LAW

Standardised enthalpy = formation term + sensible temperature term. Work on one mole basis throughout. Adiabatic flame: Q=0, W=0 ⇒ $H_{prod}(T_{ad}) = H_{react}(T_{in})$.

1. Compute reactant total once.
2. Guess product T and sum product standardised enthalpies.
3. Bracket above/below, then interpolate. Show both guesses.

10 · Psychrometry

CH 4

FOUR DESCRIPTORS, FOUR JOBS

$\omega = m_v/m_a = 0.622P_v/(P-P_v)$ · water balance

$\varphi = P_v/P_{sat}(T)$ · comfort / saturation fraction

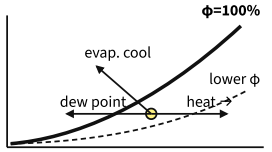
$T_{dp} = T_{sat}$ at P_v · condensation surface

T_{wb} · evaporative-process direction

Heating at fixed water content keeps ω fixed but raises P_{sat}, so ϕ falls. Cooling raises ϕ until the saturation line; further cooling removes water.

TWO-PROPERTY DISCIPLINE

KNOWN PAIR	NEXT MOVE
T and ϕ	Read/obtain $P_{sat}(T)$, then $P_v = \varphi P_{sat}$; calculate ω or plot state
T and ω	Water content fixed; use chart to read ϕ, T_{dp}, T_{wb}, h
Surface temperature	Compare with T_{dp}; surface below dew point risks condensation



State = any two properties. Horizontal left to saturation reads dew point; horizontal right is sensible heating.

11 · Cycle chooser

CH 6 TOPIC MAP

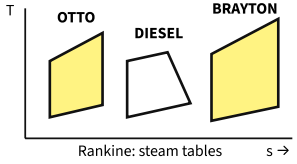
CYCLE / HEAT ADDITION	EFFICIENCY LEVER	LIMIT / INTERPRETATION
Otto constant V	$\eta = 1 - 1/r^{k-1}$; raise compression ratio r	Spark knock limits real r
Diesel constant P	r plus cut-off ratio r_c; η falls as r_c rises	Lower than Otto at same r, but real diesels tolerate much higher r
Brayton constant P, flow	$\eta = 1 - 1/r_p^{(k-1)/k}$	Regeneration helps at low r_p where exhaust remains much hotter than compressor discharge
Rankine phase-changing steam	Raise average heat-addition T or lower average rejection T	Metallurgy and wet turbine exhaust constrain the gains

First decode the ratio: r is a cylinder volume ratio; r_p is a gas-turbine pressure ratio; r_c is a Diesel cut-off volume ratio.

PERFORMANCE, NOT JUST EFFICIENCY

Mean effective pressure = W_{net} / swept volume. Use it to compare piston engines of different sizes; it is not a thermodynamic pressure at one state.

BEFORE USING A CYCLE FORMULA	WRITE
Air-standard idealisation	Ideal-gas working fluid; internally reversible compression/expansion
Component efficiencies given	Replace ideal compressor/turbine endpoints before summing q and w
Steam cycle	Locate Rankine states from steam tables; do not use ideal-gas air relations



All cycles compress → add heat → expand → reject heat; the heat-addition process selects the model.

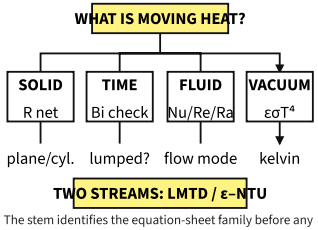
12 · Rankine improvements

CH 6 FAQ

MOVE	WHY / PENALTY
Lower condenser pressure	Lower rejection T; wetter turbine exhaust
Superheat	Raise addition T; metallurgy limits temperature

13 · Heat-transfer family

CH 7



The stem identifies the equation-sheet family before any arithmetic begins.

STEM CLUE	RECOGNITION / CHECK
Wall or pipe layers + films	Series thermal resistances; geometry decides plane or cylindrical R
Small cylinder/wire + insulation	Check critical radius before assuming more insulation lowers loss
Fin / extended surface	Fin efficiency ≤1, then overall surface efficiency
Body heating/cooling with time	Bi=hL_c/k, $L_c = V/A$; lumped only if Bi<0.1
Two fluid streams	Known terminal T → LMTD; unknown outlets → effectiveness–NTU
Convection correlation	Classify forced/natural and geometry; then Re/Nu or Gr/Ra/Pr
Surface exchange / vacuum	Radiation; all temperatures in kelvin

RESISTANCE NETWORK BUILD

1. Sketch heat direction and interfaces.
2. Write one resistance per layer and film; keep plane/cylindrical geometry consistent.
3. Add in series: $\dot{Q} = \Delta T/R_{tot}$; use partial drops for interface temperatures.

DIMENSIONLESS CLUE	MEANING
Re	Inertia versus viscosity; forced-flow regime
Pr	Momentum versus thermal diffusivity
Gr / Ra	Buoyancy-driven natural convection; Ra combines Gr and Pr
Nu	Convective enhancement over pure conduction; gives h after correlation selection
Bi	Internal conduction resistance versus surface convection resistance; Bi<0.1 permits lumped temperature.
NTU	Pairs with effectiveness when heat-exchanger outlet temperatures are unknown.
Effectiveness	Actual heat transfer divided by the maximum thermodynamically possible transfer.

Forward this to your tutorial group

SHARED BY _____

Your exam is closed book with a formula sheet provided: nothing of your own goes in. Use this to revise, not to carry.

Semester 2 formal examination period, from 16 November 2026 (the Exams Office publishes the exact date).

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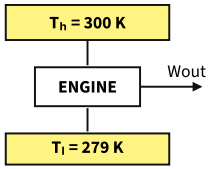
SIDE 2/2 FIVE WORKED DRILLS · judgement cards · traps · exam-morning plan

REVISION ONLY · SELF-TEST BEFORE READING

Answers carried to the source result

15 · Worked 1 · Carnot CH 1 EXAMPLE

Given: heat engine between 27°C and 6°C; real device reaches 70% of the Carnot value.



Convert before using the temperature ratio; the close reservoirs explain the low ceiling.

1. Convert: T_H=27+273=**300 K**; T_L=6+273=**279 K**.
2. η_{rev}=1−279/300=0.070=**7.0%**.
3. η_{real}=0.70(0.070)=0.049=**4.9%**.
4. Interpret: the temperature gap is small, so even the reversible ceiling is low.

ANSWER

```
Carnot ceiling 7.0%; real engine 4.9%.
```

SILENT ERROR *Celsius in any Carnot-family ratio produces a plausible-looking wrong answer.*

16 · Carnot judgement cards CH 1 FAQ

CLAIM	VERDICT
Engine efficiency exceeds η_{rev}	Impossible for same reservoirs
Cup entropy falls as it cools	Allowed: include surroundings; total rises
Real turbine exit = isentropic exit	Wrong: ideal exit is an intermediate lookup
ΔT appears only as a difference	°C and K differences have same magnitude; absolute ratios/powers still need K

CLOSED VS FLOW ORAL DRILL

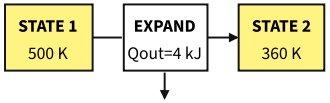
SAY THE CUE	THEN SAY THE CONSEQUENCE
Sealed piston–cylinder	Fixed mass; internal-energy balance; boundary work depends on the path
Turbine / compressor	Steady control volume; enthalpy carries flow work; solve ideal exit before real exit
Heat exchanger	Two streams; use an overall resistance and choose LMTD or effectiveness–NTU from the known terminal temperatures

TEN-SECOND FEASIBILITY SWEEP

- η and η_{is} must lie between zero and one; refrigerator/heat-pump COP may exceed one.
- A real heat engine stays below the Carnot ceiling for the same T_H, T_L.
- An isolated process requires ΔS≥0; equality identifies the reversible limit.
- A turbine with losses gives less work out and a hotter real exit than its isentropic reference.

17 · Worked 2 · Exergy CH 2 EXAMPLE

Given: 0.08 kg air; 500 kPa, 227°C → 150 kPa, 87°C; Q_{out}=4 kJ; T_0=17°C, P_0=100 kPa; c_v=0.718 kJ/(kg·K).



T_0S_{gen} = 4.36 kJ

Separate change in work potential from the part destroyed by irreversibility.

1. T_1=500 K, T_2=360 K, T_0=290 K.
2. $\Delta u=c_v(T_2-T_1)=0.718(360-500)=$**−100.5 kJ/kg**.
3. $\Delta s=c_v\ln(T_2/T_1)+R\ln(v_2/v_1)=$**0.0154 kJ/(kg·K)**.
4. $\Delta\Phi=\Delta u+P_0\Delta v-T_0\Delta s=$**−64.8 kJ/kg**; $\Delta\Phi=0.08\Delta\phi=$**−5.18 kJ**.
5. $S_{gen}=m\Delta s+Q_{out}/T_0=0.01503$ kJ/K; $X_{dest}=T_0S_{gen}=$**4.36 kJ**.

ANSWER

```
Exergy fell 5.18 kJ; 4.36 kJ was
destroyed.
```

18 · Exergy traps CH 2 FAQ

TRAP	REPAIR
"Energy destroyed"	Energy conserved; exergy destroyed
Wrong sign for Q_{out}	State sign convention before entropy balance
Uses total work as useful	Subtract surroundings work when boundary moves
No physical comment	Name friction, mixing, free expansion or finite-ΔT transfer

THREE QUANTITIES, NEVER MERGED

QUANTITY	MEANING	DIRECTION
ΔX	Change in stored work potential	Can rise or fall
X transferred	Work, mass or useful fraction of heat crossing boundary	Signed with boundary convention
$X_{destroyed}$	T_0S_{gen}; irreversibility inside chosen boundary	Never negative

BOUNDARY-CHOICE SELF-TEST

1. If the question asks for total destruction, ask whether moving the boundary out to T_0 removes the heat-exergy term.
2. If mass crosses, use flow exergy ψ; if a fixed charge changes state, use non-flow exergy ϕ.
3. If the entropy balance is shorter, use it: S_{gen} gives destruction immediately.
4. If a second-law efficiency is asked, identify whether the desired product is work out or a work input; this decides the numerator.

EFFICIENCY DISTINCTION

19 · Worked 3 · Gas mixture CH 3 EXAMPLE

Given: rigid 8 m^3 tank at 320 K; 4 kg CH_4 (M=16), 6 kg C_2H_6 (M=30), 10 kg N_2 (M=28); ideal gases.

SPECIES	N (KMOL)	Y	P_i (KPA)
CH_4	0.250	0.310	83.2
C_2H_6	0.200	0.248	66.6
N_2	0.357	0.442	118.6
Σ	**0.807**	**1.000**	**268.4**

CALCULATION CHAIN

```
m_i ÷ M_i → n_i → n → y_i → M → R → P → P_i
```

1. M=ΣyMi=**24.78 kg/kmol**.
2. R=8.314/24.78=**0.3355 kJ/(kg·K)**.
3. P=nR_uT/V=**268.4 kPa**; $P_i=y_iP$.

ANSWER

```
y=(0.310, 0.248, 0.442); M=24.78
kg/kmol; P=268.4 kPa.
```

20 · Model selection drill CH 3 FAQ

STEM	YOUR FIRST SENTENCE
Partial pressures / dew point	"Use Dalton: each component occupies the full mixture volume."
Partial volumes only	"Amagat is valid for this P-v-T calculation."
Mixture entropy	"Evaluate each component at its partial pressure."
High-pressure mixture	"Ideal-gas validity is doubtful; use named Z or Kay route."

REBUILD THE ANSWER FROM CHECKS

- **Fractions:** each 0≤y_i≤1 and Σy_i=1. The largest mole fraction should correspond to the largest n_i, not necessarily the largest mass.
- **Molar mass:** M must lie between the lightest and heaviest component molar masses.
- **Gas constant:** R=R_u/M, so a heavier mixture has a smaller mass-specific R.
- **Partial pressure:** $P_i/P=y_i$; partial pressures sum exactly to P before rounding.
- **Rigid tank:** every component shares the full V under Dalton; do not allocate V by mass fraction.

ENTROPY AND CONDENSATION GATE

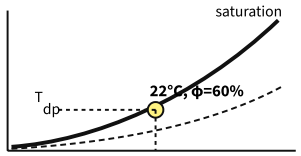
Dalton and Amagat agree for ideal-gas P-v-T calculations, but the choice stops being free once the stem mentions entropy, humidity, dew point or a condensing component. Those questions require each component's partial pressure.

NON-IDEAL CUE	WHAT EARNS THE METHOD MARK
High P / near critical region	State that ideal-gas behaviour may fail
Component Z data supplied	Use the specified mixture compressibility route
Critical properties supplied	Name Kay's pseudocritical method; do not mix routes silently

GIBBS–DALTON RECALL

21 · Worked 4 · Moist air CH 4 EXAMPLE

Given: 200 m^3 hall; 22°C, 101 kPa, 60% RH; P_{sat}=2.645 kPa; $c_{p,a}$=1.005 kJ/(kg·K); h_g=2541.0 kJ/kg.



Two properties fix the state; the worked route uses saturation pressure, then Dalton.

1. $P_v=\phi P_{sat}=0.60(2.645)=$**1.587 kPa**.
2. ω=0.622P_v/(P−P_v)=**0.00993 kg/kg dry air**.
3. h=$c_pT+\omega h_g$=1.005(22)+0.00993(2541)=**47.35 kJ/kg dry air**.
4. $m_a=P_aV/(RT)$=**234.9 kg**.
5. $m_v=\omega m_a$=**2.33 kg**.

ANSWER

```
ω=0.00993; h=47.35 kJ/kg dry air;
m_v=2.33 kg.
```

22 · Psychrometric traps CH 4 FAQ

WRONG MOVE	CORRECT JUDGEMENT
Calls ϕ "water content"	ω tracks water mass; ϕ changes with T at fixed ω
Cools below dew point with ω fixed	Condensation removes water; follow saturation line
Mixes two streams off the join	Adiabatic outlet lies on straight line between inlets
Sizes only sensible load	Outside air adds both sensible and latent load

CHART-DIRECTION SELF-TEST

OPERATION	SKETCH BEFORE NUMBERS	INVARIANT / CONSEQUENCE
Sensible heating	Horizontal right	ω fixed; ϕ falls
Sensible cooling above dew point	Horizontal left	ω fixed; ϕ rises
Cooling below dew point	Reach saturation, then move along boundary	Condensate leaves; ω falls
Evaporative cooling	Up-left along wet-bulb line	T falls while ω rises
Reheat after dehumidifying coil	Horizontal right from cold saturated state	Delivery T rises at fixed ω

LOAD JUDGEMENT

- Sensible loads come from temperature-raising sources such as lights, equipment, solar gain and conduction.

23 · Worked 5 · Propane CH 5 EXAMPLE

Given: C_3H_8 burned with 30% excess air at 101 kPa. Find reaction, A/F, ϕ and product dew point.

1. Stoichiometric: $C_3H_8+5(O_2+3.76N_2)\rightarrow 3CO_2+4H_2O+18.8N_2$.
2. 30% excess air: $C_3H_8+6.5(O_2+3.76N_2)\rightarrow 3CO_2+4H_2O+1.5O_2+24.44N_2$.
3. A/F=(892.3 kg air)/(44 kg fuel)=**20.3**.
4. $\phi=(F/A)_{actual}/(F/A)_{stoich}=15.6/20.3=$**0.77, lean**.
5. $P_v=4/(3+4+1.5+24.44)\times 101=$**12.27 kPa**; interpolate saturation data: $T_{dp}\approx$**49.9°C**.

ANSWER

```
A/F=20.3; φ=0.77 lean; product
T_dp≈49.9°C.
```

ATOM AUDIT *Check C, H, O and carried N before any ratio. One coefficient error contaminates every later answer.*

COMBUSTION INTERPRETATION

OBSERVATION	WHAT IT PROVES
O_2 remains in products	Air supplied exceeded stoichiometric requirement; mixture is lean
ϕ=0.77<1	Actual F/A is below stoichiometric F/A; same lean conclusion
Exhaust cooled below 49.9°C	Product water begins to condense; corrosion risk motivates dew-point control
Hot exhaust vents water as vapour	Use LHV because latent heat is not recovered

For an adiabatic-flame-temperature question, balance species first, evaluate reactant standardised enthalpy once, then bracket the product temperature with two table-based guesses and interpolate. Extra air increases the mass heated and lowers the flame temperature.

24 · Cycle rapid recall CH 6

OTTO	DIESEL	BRAYTON	RANKINE
const V	const P	gas flow	steam

r, knock | r_c, r↑ | r_p, regen. | wetness

process → ratio → limit

Recall the defining process and limiting physics, not just an efficiency expression.

PROMPT	RESPONSE
Diesel vs Otto at same r	Diesel ideal efficiency lower; real diesel can use much higher r
Low-r_p gas turbine	Regenerator may recover hot exhaust into compressor discharge
Lower Rankine condenser P	Efficiency rises, but turbine-exit moisture and blade erosion worsen
Component η supplied	Apply Ch 1 ideal-exit → scale → actual-exit sequence before cycle η

25 · Heat-transfer three-card drill CH 7 EXAMPLE

CARD	SAY BEFORE CALCULATING
Pipe, radii, L, heat loss per length	"Cylindrical conduction resistance; include films if given."
Metal sphere in stirred bath	"Try lumped capacitance, but first Bi=h(V/A)/k<0.1."
Parallel plates, vacuum	"Radiation only; convert both temperatures to kelvin."

26 · Heat-exchanger split CH 7 FAQ

KNOWNS	METHOD	WHY
All terminal temperatures, or 3 + energy balance	**LMTD**	ΔT_{lm} can be formed directly; $Q=UA\Delta T_{lm}$
Outlet temperatures unknown	**Effectiveness–NTU**	Avoids iterative unknown ΔT_{lm}

Resistance network: build 1/UA from series convection and conduction resistances. Finned side uses overall surface efficiency, not fin efficiency alone.

27 · Final trap table CHS 1–7

LOOKS PLAUSIBLE	FAILS BECAUSE
Carnot/radiation in °C	Absolute temperature required
Amagat for dew point	Condensation needs Dalton P_i
ϕ rises when excess air rises	More air makes mixture leaner; ϕ falls
More pipe insulation always helps	Below critical radius, area effect can dominate
Lumped model without Bi	Uniform internal T not established
Ideal turbine exit reported	Component efficiency still needs applying

28 · Exam-morning plan COURSE STRATEGY

1 NAME	2 STATE	3 CHECK	4 READ
family	boundary	units / K	meaning

method first · interpret last

Four moves to rehearse without notes: identify, define, check, interpret.

1. Recall six families aloud: energy/entropy; exergy; mixture; moist air/combustion; cycles; heat transfer.
2. For each, say one assumption and one free check.
3. Rework one opening line only: boundary, state variables, units, method.
4. Stop learning new material; use the supplied sheets by location and cue.

DURING THE PAPER *Box outputs with units, then ask whether sign, scale and physical direction make sense.*

LAST-PASS AUDIT

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SHARED BY _____

Your exam is closed book with a formula sheet provided: nothing of your own goes in. Use this to revise, not to carry.

Semester 2 formal examination period, from 16 November 2026 (the Exams Office publishes the exact date).