

!

"#\$%&' (!)!*+, -. /0!-. !10+/23-. 4!

#\$%&' (!)*)*!

+ , %- . /!0123' !#43, %&' (3' !5, 63/7!89+&' !

*5%61*7*!68!9#:"6; <*:!

"=> **!?! "6%9>"9!7%86<\$>976%!

!
!

"!

N9] ' 23%/6, ' 2!6K3!K&/6; %&- ,1E6K3; 1; (&- ,1!23S31; \$ < 3' 6!; U!6K3!#3S3' 6KE

!
!

)!

16*9H7%9:%*7T:!"6; <*:!<:c; 7<:\$:%9*!

!
!

D!

N9 i &11&, </7! m9! ?) *''FB9!

9!

51; ; <&' (6; ' 7!@Mn1&P%&/9!?K' ' !O/4+AB!!

!

%69: MO(, &' 7!6&613!\$, (3/!, ' 2!P&P1&; (%, \$K&-!&' U; !2; !%69!" 6; %9!6; 4, %2!6K3!%3W. &%32!%3, 2&' (9!!

!

h; %!@#5a!, ' 2!\$%&-3!&' U; %<, 6&; ' 7!\$13, /3!/33!3, -K!1&/6&' (!, 6!6K3!O' 2%34!/!] ' &S3%/&6C!

!

!

!

b, &17! + 9!, ' 2!>959![, %/; ' 9!?"ppDB9!
b%, ' 2!g, \$&2/7! + @! : ; ' 23%S, ' 9

!
b%3&2, ' . /7!#9!?" pppB9!

b%, ' 2!g, \$&2/7! + @! ^3%2 < , ' /9!

!
b%3&2, ' . /7!#9!?) *") B9!

9!b%, ' 2!!

! g, \$&2/7! + @! ^3%2 < , ' /9!!

!
m3&/13%7!b9!?) ** I B9!

9!a, /KS&1137!JaM5Lm!Z. P1&/K&' (9!!

!
[; ' (7!J9b9!?"pFpB9!

!ZK&, 231\$K&, 7!ZOMO. (/P. %(!!

! h; %6%3//9!

!
[; ' (7!J9b9!?) ** _B9!

!
!

0!

Z%; -6; %7!#989!?"ppDB9! 9! =, 113C!!
! h; %(37!ZOMo. 2/; ' !Z%3//9!!
!
g; P&' /; ' 7!m9i 9!?)**DB9!
9!N%2!32&&; ' 9!b%, ' 2!g, \$&2/7! + @!5, Y3%0!!
!
#-K. 16T37!k%09!?)**DB9! b%, ' 2!!
! g, \$&2/M5, Y3%0!!
!
#6; 667!09!?"pF)B9! 9!b%, ' 2!g, \$&2/7! + @!1
! ^3%2 <, ' /9!!
!
#. ' . Y0&, ' 7!89g9!?)**I B9!
9!b%, ' 2!g, \$&2/7! + @!1 %3 (319!!
!
J, C1; %7!5959!?"ppNB9! [, ' K, <7! + 89M>; 413C!Z. P1&-, 6&; ' /9!
!
i , 1/K7!09!?)**NB9!
! >K&- , (; M + ; ; 2C9!!
!
i , 1/K7!09!?)**pB9! [; . &/S&1137!! XM!!
! i 3/6<&' /63%do; K' !! ' ; V9!! !
!
i , %3' 7! + 909!?)**"B9! 9!8; 4' 3%!/b%; S37!@!M@ 63%=, %/&6C!Z%3//9!!
!
i &11m&637!! 9!, ' 2!#9 + 9!b&P/; ' 9!?"ppFB9!J
9!b%, ' 2!g, \$&2/7! + @!5, Y3%0!!
!
i &1/; ' 7!Z9#9!?"pp)B9!

!
!
!

5, 1C9!89!?"pI DB9!

!a34!X; %Ym, %\$3%L!g; 49!

!

5%&/-; 7!J9=9!?"pppB9!

5%; , 2<, ' !L!m; 1<, ' !

!

5. 66%&-Y7!b909!?!^29B9!?"pO) B9!

!

!

F!

>; .%/3!/U; %/2/Y+, -2!, /AC+0iA!Y+40++A!739(9! + O!qg3l&(& ' rB!, ' 2!/@YB2CB0/@Y+40++A!
&' -1. 23!! F!-. ACOL2CB0!2B. C/2C!3BLOA!, ' 2!EF!3BLOA!BP!-. Y+O+. Y+. C!@+/0. -. 4!/2C-U-C-+A9!!

!

93+!2/@L@/C-B. !BP!3BLOA!-A!N/A+Y!B. !C3+!ACLya!AV-@A!BP!C3+!/U+0/4+!W+@#00+0/0+Y!40/YL/C+!
ACLY+. C9!#6. 23' 6/!4K; !, %3!43, Y!&' !6K3/3!/Y&1!/?"B!<, C!%3W. &%3!<; %3!6&<3!, ' 2!/K; . 12!-; ' /&23%
6, Y&' (!U343%&-1, //3/!3, -K!/3<3/63%&! , ' 2!?)B!-, ' !U&' 2!/Y&1!23S3!; \$<3' 6!, //&/6, ' -3!6K%; . (K!6K3!
#3<&' , %. 2C!, ' 2!g3/3, %-K!#Y&1!/!>; 11; W. &, 7!6K3!O] !i %&6&' (!>3' 63%&! , ' 2!6K3!O] !#6. 23' 6!
#. --3//!; UU&-39!!

!

@ !; %23%&6; !, -K&3S3!6K3!; . 6-; <3/!; U!6K&/!-; . %/37!13, %' &' (!6&<3!4&1!P3!2&/6%&P. 632!, /!U; 11; 4/M

!

7. ACOL2CB0!"B. C/2C!#BLOA!	! 8/2+HCBH8/2+!7. ACOL2C-B. /@9-, +! ! 6C3+0!7. ACOL2CB0HR-0+2C+Y!>2C-U-C-+A!	! NO!K; . %/! ! p!K; . %/! !
7. Y+O+. Y+. C!+=/0. -. 4!>2C-U-C-+A!	! <+ /Y-. 4! ! *+0, B. A!V. 2@LY-. 4!10+O!1/O+0A]! ! *+@H>AA+AA, +. C!	! D!K; . %/! ! DI !K; . %/! ! NIK; . %/!
9BC/@#BLOA!	!	I ' F!3BLOA!

!

S; 7R: =7%: *!86<! "6; <* : !>*7S%\$: %9*!

!

b%, 23/!, %3!P, /32!; ' !6K3!&' 23\$3' 23' 6!13, %' &' (!, -6&S&6&3/!P3!; 4!4 K&-K!\$%; S&23!\$, -6&-3!6; 4, %27!
, ' 2!, //3//<3' 6!; U7!6K3!13, %' &' (!; . 6-; <3/!; U!6K&/!-; . %/39!>; . %/3!, //&(' <3' 6/!, ' 2!6K3!(%, 23!
43&(K6&' (!U; %&3, -K!, //&(' <3' 6!, %3!\$%; S&232!&' !6K3!-K, %6!P3!; 49!#\$3-@U&-!2. 3!2, 63/!, %3!(&S3' !&' !
6K3!>; . %/3!\S3%\$&34!, P; S39!!

!

>AA-4. , +. C!R+A20-OC-B. A!	M+-43C-. 4!
"9 5; ; Y!g3S&34/!"7!)!L!N!	O*!\$; &' 6/G!) *!\$; &' 6/!3, -K!
)9 #3%<; ' !Z%3\$, %, 6&; ' !Z, \$3%/!"!L!)!	F*!\$; &' 6/G!D*!\$; &' 6/!3, -K!
N9 #3%<; ' !+, ' . /-%&\$6/!"!L!)!)*!\$; &' 6/G!"*!\$; &' 6/!3, -K!

D9

!

p!

!

_9 J4; EZ, (3!g3U13-6&; ' !; ' !Z%3, -K&' (!O%6&-13!	"*!\$; &' 6/!
09 #3%<; ' !A)!Z%3, -K&' (!&' !>; ' (%3(, 6&; ' , 1!#366&' (!	_!\$; &' 6/!

19 Z%3, -K&' (!#31UEO//3//<3' 6!

"*!\$; &' 6/!

!

"*|

S<>R7%S!<; Q<7"!86<!*: <\$6%!R: =7T: <5!

!
*CLY+. C!%/ , +D!

!
! : Z2+OC-B. /@ 10BP-2-+. C! */C-AP/2CB0a!
! EFHFJ!OB-. CA!! EJHEE!OB-. CA!! ' FH' GIOB-. CA!!

!
!

""|

S<>R7%S!<; Q<7"!86<!M<799: %!> **7S%\$: %9*!

!

: @, +. CA!	: Z2+ . C!\ GHKJ!	10BP-2+. C!\ (HI e]!	*/C-AP/2CB0a!\ FHI &]!	8/-0!\I ' HI E]!	1BB0!\JHI K]!
-------------	-------------------	----------------------	------------------------	------------------	---------------

"B, , L. -2/C-B. !/. Y! @. 4L/4+!	=3C!&' 63%3/6&' (! &' /\$8&&' (! 6K; . (K6! \$%; S; Y&' (!4-31IE , %6&- . 1, 632G!' ;! <; %3!6K, ' !64; ! /\$311&' (!<6/6, Y3! , ' 2!(%, <<, 6&- , 1! ; %!/6C13!3%%; %!\$3% \$, (39!!	@/!, %6&- . 1, 637! K; 12/!6K3! %3, 23% /! , 663' 6&; ' !HI' ; ! <; %3!6K, ' !6K%33! /\$311&' (! (%, <<, 6&- , 1; %! /6C13!3%%; %!\$3% \$, (3!	Z, \$3%&!/! (3' 3%, 11C!4-311! 4%&63' 7!P. 6! /; <36&<3/!1, -Y/!
--------------------------------------	--	--	---

!
!

")!

>06; 9!56; <!7%*9<; "96<!

!
\$/02LA! >@Y+. ! *W+/0-. 4+ . ! Q/C+A! K, /! /3%S32! &' ! 6K3! #3S3' 6KE2, C!
O2S3' 6&/6!<&' &/6%C!, /!, ' !3S, ' (31&/6!, ' 2!\$, /6; %&/&' -3!"ppp9!m3!/\$3' 6!6K3!
U&/6!/3S3' !C3, %/!; U!K&!<&' &/6%C!, /!, !-; ' U3%3' -3!3S, ' (31&/6!&' !6K3!h!; %&2, !
>; ' U3%3' -37!, ' 2!K, /!/&' -3!/3%S32!, /!6K3!/3' &; %&\$, /6; %&&' !S, %&; . /!-K. %-K!
2&/6%&-6/! 4&6K&' ! 6K3! >, %; 1&' , 7! >K3/, \$3, Y37! , ' 2! b3; %(&, E>. <P3%1, ' 2!
>; ' U3%3' -3/9!m3!-. %&3' 6!C!/3%S3!/!, /!6K3!/3' &; %&\$, /6; %&; U!6K3!I ' ; VS&113!
h&/6!#3S3' 6KE2, C!O2S3' 6&/6!>K. %-K!&' !! ' ; VS&1137!J3' ' 3//339!O!', 6&S3!; U!
5, 6K7! +, &' 37!8%9!5, 63!/K; 12/!. ' 23%(%, 2. , 63!23(%33!/&' !O' 6K%; \$; 1; (C!
, ' 2!m&/6; %C!?] ' &S3%/&6C!; U! +, &' 37!"pp"B7! +, /63%/!83(%33!/&' !^S, ' (31&/<!?#; . 6K3%' !O2S3' 6&/6!
] ' &S3%/&6C7!)**DB7!m&/6; %C!?!O<3%&- , ' !+ &1&6, %C!] ' &S3%/&6C7!)*"NB7!, ' 2!5&P1&-, !!L!JK3; 1; (&-, !!#6. 2&3/!
?#; . 6K3%' !O2S3' 6&/6!] ' &S3%/&6C7!)*"_B7!, ' 2!, !8; -6; %&; U! + &' &/6%C!23(%33!&' !Z%3, -K&' (!?O' 2%34/!
] ' &S3%/&6C7!)*"pB9!m3!\$%3/3' 6!C!%3/&23!/&' !! ' ; VS&1137!J3' ' 3//33!4&6K!#, %, K7!K&!4&U3!; U!"p!C3, %/7!
, ' 2!6K3&6K%33!3' 3%(36&-!633' , (3%/9!!
!

69#: <! "6; <*: H<: =>9: R!16=7"7: *!

!
>2/Y+, -2!7. C+40-Ca!!
!
JK3!#3<&' , %C!3V\$3-6!/&6!/6. 23' 6!/6; !3VK&P&6!%&(; %; . /! <; %, !&' 63(%&6C! , \$\$%; \$%&, 63!6; ! <&' &/6%C!
13, 23%/!%3\$%3/3' 6&' (1o3/ . /!>K%&/69!>; <\$1363!K; ' 3/6C!&' !, -, 23<&-!<, 663%/!&/!, !S&6, !!-; <\$; ' 3' 6!; U!
/. -K!&' 63(%&6C9!O' C!P%3, -K!; U!, -, 23<&-!&' 63(%&6C&' !6K&/!-1, //&/!/. P03-6!6; !2&/-&\$1&' 39!

!
! "N!

Z%3/3' 6&' (!, ' ; 6K3%/14 ; %Y!, /! ; ' 3' /! ; 4' !?39(97!\$1, -3<3' 6!3V, </7!K; <34 ; %Y!, //&' <3' 6/B9!
] /&' (!<, 63%&, 1/!2. %&' (!, !W. &T! ; %&3V, <&' , 6& ; ' ! ; 6K3%&6K, ' !6K ; /3!3V\$1&-&6!C!, 11; 432!PC!6K3!
63, -K3%& ; %!\$% ; (% , <9!!
#63, 1&' (?! , --3\$6&' (?! ; %&/6. 2C&' (!U% ; <!/6; 13' !W. &TT3/! ; %&3V, <&' , 6& ; ' !<, 63%&, 1/9!!
> ; \$C&' (!U% ; <! , ' ; 6K3%/6. 23' 6!2. %&' (!, !%3(. 1, %& ; %&6, Y3EK ; <3!63V6! ; %&W. &T9!!
O//&/6&' (!, ' ; 6K3%&&' !, -6/! ; U! , -, 23<&-!2&/K ; ' 3/6C9!!
#. P<&6&' (!6K3! /, <3! 4 ; %Y! ; %& <, 0 ; %& \$; %&6 ; ' /! 6K3%3 ; U! 4&6K ; . 6! \$3%<&/& ; ' ! U% ; <! 6K3!
&' /6%. -6 ; %/7!6 ; !/ , 6&/UC!6K3!%3W. &3<3' 6/! ; U! < ; %3!6K, ' ! ; ' 3!- ; . %/39!!

!

h; %&, 22&6& ; ' , !1236, &/!/33MK66\$/Mdd4449, ' 2%34/932. d, -, 23<&-/d, -, 23<&-t&' 63(%&6C9K6<19!!

!

>2/Y+, -2!>22B, , BY/C-B. A!!

!

@!C ; . !W. , 1&UC!U ; %! , -- ; << ; 2, 6& ; ' ! . ' 23%&6K3!O<3%&- , ' !8&/, P&1&6&3!/O-67!\$13, /3! - ; ' 6, -6!#6. 23' 6!
#. --3//!&' !a36K3%C!m, 11!""*!?!2&/, P&1&6&3/R, ' 2%34/932. ! ; %&)OpEDI "EO*pOB!, /! / ; ; ' !, /!\$; //&P13! / ; !
6K, 6!, -- ; << ; 2, 6& ; ' /!-, ' !P3!, %%, ' (329!!

!

; A+!BP! : @+2C0B. -2A!

!

a ; !%3- ; %2&' (! ; %&/6%3, <&' (!&/!\$3%<&6632!, 6!, ' C!6&<3!&' !, ' C!/3<&' , %C!- ; . %/3/9!> ; . %63/C7!%3/\$3-67!
, ' 2!\$% ; U3//& ; ' , 1&/<!2&-6, 63!6K, 6!1, \$6 ; \$/!, ' 2!-311!\$K ; ' 3/!, %3!6 ; !P3!. /32! ; ' 1C!U ; %&-1, //E%31, 632!
, -6&S&6&3!/2. %&' (!-1, //!6&<39!

!

"D!

!

: , +04+. 2a!10BCB2B@

!

O' 2%34/!] ' &S3%/&6C! 6, Y3/! 6K3! /, U36C! ; U! &6/! /6. 23' 6/! /3%&; . /1C9! #&(' /! &23' 6&UC&' (! 3<3%(3' -C!
\$%; 6; -; 1!, %3!\$; /632!6K%; . (K; . 6!-, <\$. /!P. &12&' (/9!@ /6%. -6; %/!4&1!\$%; S&23!(. &2, ' -3!, ' 2!2&&3-6&; ' !

!
!

"_

>11: %R7h! I D!7%9: <1<: 97%S!=: 99: <!S<>R: *!

!
=+CC+0!S0/Y+A!/. Y!1+02+. C/4+A!!

! !
 S0/Y-. 4!*2/@!

! O!! pDj s! ! >s! I OEI pj !
 OE p*EpNj ! >! I NEI _j !
 5s! FIEFpj ! >E! I *EI)j !
 5! FNEF0j ! 8! O_E0pj !
 5E! F*EF)j ! h! ODj !, ' 2!53!; 4!

!
9#: !Q!S<>R: !!

JK3!5!(%, 23!&! /&(' !6K, 6!C; . !K, S3!-; <\$363' 6!C!U. 1U&1132!, 11!; U!6K3!%3W. &%3<3' 6!/!6&\$\$. 1, 632!U; %&, ' !
, //3//<3' 6!; %&-; <\$363' -C!3S, 1. , 6&; ' 9!!&!&! /, IS3%!(; ; 2!(%, 23!, ' 2!23<; ' /6%, 63!/!, !K&(K!13S31!; U!
6K3!Y'; 4132(37!&' /&(K67!-%&&- , 1!-; <\$363' -3!, ' 2!\$%; U3//&; ' , !!\$%3/3' 6, 6&; ' !/6, ' 2, %2/!3//3' 6&, 1!U; %&
, ' !& 2&S&2. , !!4&/K&' (!6; !\$. %/ . 3!, !-, %33%!, /!, !!\$%; U3//&; ' , 1!13, 23%&! !<&' &/6%C9!

!
9#: !>!S<>R: !!

O' !O!(%, 23!&!(&S3' !; ' 1C!4K3' !, !/6. 23' 6! ; 6!; ' 1C!U. 1U&11/!6K3!-%&63%&, !U; %&, !5!(%, 237!P. 6!&' !2; &' (!/; !
23<; ' /6%, 63!/!, ' !, 2S, ' -32!, -, 23<&-!, \$6&&. 23!U; %&-; ' 63' 6!Y' ; 4132(37!-%&6&W. 37!/C' 6K3/&/!, ' 2!
&' 23\$3' 23' 6!&' /&(K67! 4K&13! 3VK&P&&&' (!K&(K1C! 23S31; \$32!-; <<. ' &- , 6&; ' !/Y&11/!, ' 2!\$%; U3//&; ' , !!
\$. P1&- , 6&; ' !/6, ' 2, %2/!6K, 6!4; . 12!, 11; 4!6K3<!6; !\$. %/ . 3!, !K&(K1C!-; <\$36&&S3!, -, 23<&-!-, %33%!

!
9#: !"!S<>R: !

JK3!>!(%, 23!2&U3%/!; ' 1C!U%; <! , !5!(%, 23!&' !6K, 6!6K3!6%, &&/!; . 6!&' 32!&' !6K3!5!(%, 23!, P; S3!, %3!' ; 6!
-; ' /&/63' 6!C!, \$!&329!m; 43S3%7!4&6K!2&1&(3' -3!, ' 2!PC!, \$!C&' (!U332P, -Y!U%; <!C; . %!13-6. %3%7!6K3!
, -, 23<&-!\$%; -3//!-, ' !!\$%; S&23!; \$\$; %6. ' &6C!U; %&, !/6. 23' 6!6; !&<\$%; S3!6K3&&!-; ' /&/63' -C7!, ' 2!K3' -37!
6K3&&! (% , 239!

!
9#: !R!S<>R: !

JK3!8!(%, 23!\$; &' 6!/6; !, !1&<&632!13S31!; U!Y' ; 4132(37!&' /&(K67!, ' 2!- (3 (627!, ' &&11B&2&&3&1/' 3!-2W(6)8(2)' 31

!
"!"
!

+0, B. ! [K!] !10B03+C-2!10+/23-. 4!+0, B. !10+0/0/C-B. !1/O+0!8B0, /C!SL-Y+!EJ!OB-. CAB!

!

"9 ^V\$1, &' !C; . %! . ' 23%/6, ' 2&' (!; U!Z%; \$K36&-!Z%3, -K&' (!, ' 2!K; 4!&!&' U1. 3' -32!C; . %!-K; &-3!; U!
!,\$3%&-; \$3!, ' 2!/6, 6. /!W. ; !-K, 113' (32!&' !6K&!/3%<; ' 9!?' !OB-. CAB!!

!

)9 >13, %!C!&23' 6&UC7!&' !, !/K; %6!6K3/&!/6, 63<3' 6!6K3!/6, 6. /!W. ; !&/!. 3!6K, 6!C; . !, %3!-K, 113' (&' (!
, ' 2!4KC9!?' !OB-. CAB!

!

N9 ^V\$1, &' !6K3!6K%33!-; <\$; ' 3' 6!/; U!\$%; \$K36&-!\$%3, -K&' (?! , ' 2!K; 4!6K3C!, %3!&' 63(% 632!&' 6; !
C; . %! /3%<; ' 9!?' !OB-. CAB!

!

D9 @23' 6&UC! K; 4! <, ' C! ; U! J&/2, 13` /! /3S3' !K, 11<, %Y!/ ; U! Z%; \$K36&-! Z%3, -K&' (!C; . !, \$\$1C! ; %!
, <\$!&UC! ; ' !&' !C; . %! /3%<; ' 9!?' !OB-. CAB!

!

_9 8363%<&' 3!, ' 2!23/-%&P3!6K3!\$, %, <363%/!; U!6K3!\$, //, (3!6K, 6!C; . !, %3!\$%3, -K&' (!U%; <7!, ' 2!
P%&3U!C!3V\$1, &' !K; 4!6K3!\$, //, (3!%31, 63!/6; !&6!/P%; , 23%!/-%&\$6. %, 1!-; ' 63V6!73/\$3-&, 11C!6K3!
%3/6!; U!6K3!-K, \$63%B9!?' !OB-. CAB!

!

09

!
!

"p!

P9 J%, '/&&&'; '/! ! ! ! "!)! N! D! _!
-9 J&<3!h%, <3! ! ! ! "!)! N! D! _!

!

R+@U+0a!

!

,9 O. 6K3' 6&-&6C! ! ! ! "!)! N! D! _!
P9 =; &-3!?!J; ' 3d=; 1. <3d=, %&, 6&; ' B! "!)! N! D! _!
-9 +; S3<3' 6db3/6. %3/!! ! "!)! N! D! _!
29 #-%&\$6. %3!g3, 2&' (! ! ! " " " " " " " "

!

!

)"!

APPENDIX: PROGRAM LEARNING OUTCOMES

!

\$^>^!-. !1/ACB0/@\$\$. -AC0a!?!+ OZ + B!

!

"9 831&S3%3UU3-6&S3!P&P1&- , 11CEP, /32!/3%<; ' /9!!

)9 83<; ' /6%, 63!\$%; \$3%!P&P1&- , 1!&' 63%\$%36, 6&; ' !/Y&11/9!!

N9] ' 23%/6, ' 2!6K3!K&/6; %&- , 1E6K3; 1; (&- , 1!23S31; \$ < 3' 6!; U!6K3!#3S3' 6KE2, C!O2S3' 6&/6!
>K. %-K9!

D9 ^VK&P&6!-, \$, P&1&6C!U; %!6%, &' &' (!-K. %-K!< 3<P3%/!U; %!3S, ' (31&/<9!

_9 83<; ' /6%, 63!, ' !. ' 23%/6, ' 2&' (!; U!K; 4!6; !3<\$; 43%!-K. %-K!< 3<P3%/!U; %!13, 23%/K&\$9!

O9 ^VK&P&6!-, \$, P&1&6C!U; %!%3, -K&' (!/\$3-!U&-!;/; -&, 1!(%; . \$/9!!

!

!

!

))!